

E/M Corp, 875 E. Mando, Mt View

STATE OF CALIFORNIA

PETE WILSON, Governor

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION
2101 WEBSTER STREET, SUITE 500
OAKLAND, CA 94612
(510) 286-1255



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Date: September 9, 1993
File No. 2189.8469(JMH)
.8133

Certified Mail No. P 377 814 095
Return Receipt Requested

Mr. Gregory M. Keough, Vice President
Engineering & Regulatory Affairs
E/M Corporation
P.O. Box 2400
2801 Kent Avenue
West Lafayette, Indiana, 47906

Subject: Cleanup and Abatement Order No.93-99 for Mountain View Facility

Dear Mr. Keough:

Please find enclosed a copy of Cleanup and Abatement Order No. 93-99. This Order replaces Order No. 93-49. General changes in the Order reflect discussions with you in a meeting on July 27, 1993 on our office, while individual changes were worked out in detail with my staff and your attorney. This Order requires you to determine the nature and extent of soil and groundwater pollution caused by operations at the E/M facility in Mountain View California, and for you to propose remedial actions. Hewlett-Packard is also being asked, in a letter citing §13267 of the California Water Code, to conduct an investigation to determine the vertical and lateral extent of contamination resulting from their operations.

Hewlett-Packard is also being asked pursuant to Section 13267 of the California Water Code, to conduct an investigation to determine the vertical and lateral extent of contamination on the north side of their Mountain View site.

The requests for work made in the letter sent to HP and in this Order are intended to encourage cooperation during site investigation between H-P and E/M. However, Board staff expects a detailed workplan for site characterization, whether it is a single

document derived from mutual cooperation or an individual workplan from HP. The investigations required of each company are meant to be parallel thereby encouraging cooperation.

If you have any questions, please contact John Hillenbrand at (510) 286-0671.

Sincerely,

5031



Steven R. Ritchie
Executive Officer

Attachment: CAO NO. 93-99

cc: R.W Vogel

3793 Woodside Road
Woodside, CA 94062

Anthony Yepes
E/M Corporation
875 Maude Avenue
Mountain View, CA 94043

Jonathan Bauer
Hewlett-Packard Company
1501 Page Mill Road Bldg. 5U
Palo Alto, CA 94304

Lee Esquibel
Santa Clara County Health Department
2220 Moorpark Avenue
San Jose, CA 95128

Tom Iwamura
Santa Clara Valley Water District
5750 Almaden Expressway
San Jose, CA 95118-3686

Bill Grimes
Santa Clara County Health Department
Office of Toxics Enforcement
2220 Moorpark Avenue
San Jose, California 95128-2690

Dan Armenta
City of Mountain View, Utilities Department
231 North Whisman Road
Mountain View, CA 94039-7540

Barbara Cook
California Environmental Protection Agency
Department of Toxic Substances Control Region 2
700 Heinz Avenue, Ste. 200
Berkeley, CA 94710-2737

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

CLEANUP AND ABATEMENT ORDER NO. 93-099

REVISING CLEANUP AND ABATEMENT ORDER 93-049

E/M Corporation
875B Maude Avenue
Mountain View, Santa Clara County

R.W. Vogel
d.b.a. Delucci and Vogel
3793 Woodside Road
Woodside, Santa Clara County

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter called the Board), finds that:

1. SITE LOCATION AND DESCRIPTION

- 1.1 E/M Corporation operates a coating facility at 875 Maude Avenue. The land has been leased by E/M Corporation since approximately 1970.
- 1.2 The E/M Lubricant (E/M) facility is located at 875B Maude Avenue in an area south of Highway 101 and west of Highway 237 ("the Site"). The location is shown on Figure 1. The site is about 50 feet above sea level on the relatively flat alluvial plain, formerly an agricultural area now converted to light industry. The property is located on a parcel approximately one acre in size and includes a single story building and a paved parking lot. The total size of the E/M facility is about 11,200 square feet. The total size of the building in which E/M is located is about 16,500 square feet. The building is used for manufacturing and offices.
- 1.3 E/M operates a dry lubricant application facility. This process involves the application of graphite or molybdenum coatings to metal parts. Degreasing is a component of this process.
- 1.4 The north side of the property bounds on Maude Avenue, the east side on Martex Circuits (885 Maude), the south side on Hewlett-Packard (HP) and the west side on DOO WAH Products (855 Maude Av).
- 1.5 The area between the south side of the E/M building and the property line with HP to the north consists of a paved strip of land approximately 10 feet wide (Figure 2). This strip contains a large roll-off bin for containment of flammable solvents, an air compressor and has been an area where spent flammable

solvent waste has been stored in 55 gallon drums outside of the roll-off bin container. Two doors lead from inside the E/M building to this back area.

According to the current E/M site manager, a previous employee has stated that upon receiving a shipment of PCE, workers would fill the degreaser and put the rest out in back (south side of building) and only waste solvent was stored out in front to be picked up.

In addition to Board staff, Bill Grimes, a Hazardous Materials Specialist with the County of Santa Clara Health Department, was also present during the discussion with the current site manager and recalls the above conversation. E/M management have stated that they do not believe that PCE was stored on the south side of the building.

- 1.6 The south side of the E/M-HP property boundary is marked by a planter containing irrigated oleander bushes. This planter is approximately 6 feet wide and slopes with the E/M facility being 2 feet below a parking lot of the HP facility. The upper (southern) edge of this planter (next to HP) has a 3 to 4 inch high curb built in 1967 when the adjacent HP building was constructed. This curb prevents water from running into the planter and directs flows into the storm drain.

In this Order, references to the south side of the E/M facility, or to the E/M site may include the planter strip which is owned by Hewlett-Packard.

2. SITE HISTORY

- 2.1 The building is currently owned by Delucci and Vogel, who lease the property to E/M Corporation, a wholly-owned subsidiary of Great Lakes Chemical. E/M has operated the site since approximately 1970. Previous ownership and tenancy information is unknown. The construction date of the building is not on record but aerial photographs indicate construction in approximately 1964. Records concerning previous tenancy, if any, are unknown.
- 2.2 Between October 1985 and July 1986 several soil samples were taken in the planter behind the E/M facility. These samples were taken to assess the reason for medical difficulties experienced by a gardener employed by HP and working in that area. The samples found up to 7,700 ppb toluene, 4,000 ppb Tetrachloroethene (PCE), and 275 ppb Methyl Ethyl Keytone (MEK). The gardener was apparently repairing the irrigation lines that had been in contact with organic solvents.

- 2.3 On June 2, 1993 the Executive Officer signed Cleanup and Abatement Order No. 93-49 and later amended it with a Self monitoring Program signed on June 8, 1993. The Order and its amendment are being replaced to reflect changes requested during discussions with E/M Corporation.

3. HYDROGEOLOGY

- 3.1 Groundwater at the site is between 17 and 22 feet below ground surface (bgs) with the ground-water flow to the north. Three ground-water monitoring wells were previously installed by E/M with a gravel pack interval between 17 and 32 feet bgs. There appears to be a high permeability channel passing beneath the HP and E/M facilities.
- 3.2 The general stratigraphy beneath the site consists of the following: 0 to 2.5 feet bgs black clay; 2.5 to 20-25 feet bgs interbedded clay silts and sands, generally yellow or brown and not laterally continuous; 20-25 to 30 feet bgs interbedded brown silts, sands and gravels with minor blue-gray clays; 30-50 feet bgs blue-gray silty clay; 50-70 feet bgs brown gravelly sand, with minor brown silts and clays.

4. CHEMICAL HISTORY

- 4.1 Chemical history at E/M is divided into areas of use and areas of storage as shown on Figure 2. This information was obtained by site inspections, employee interviews and from a letter to Board staff describing chemical use information dated February 12, 1987.
- 4.2 Chemical storage at the facility before 1980 is not known by Board staff. Chemical storage after 1980 has been in two areas: The south side chemical storage area (Seatainer) and the north side where chemicals were chemicals were stored in the building. According to E/M personnel, temporary storage of chemicals waiting for disposal is primarily on the north side of the building.
- 4.3 Chemical use at the facility is only known between 1980 and 1986. Chemical use has not been requested for the years 1987 through 1993. Use between approximately 1962 and 1980 is unknown.
- 4.4 E/M used over 3,300 gallons of PCE at the facility between 1980 and 1986. E/M also handled substantial amounts of MEK (8,330 gallons), toluene (1,730

gallons), and TCE (290 gallons) during this time. The facility changed the degreasing operation from PCE to 1,1,1-Trichloroethane (1,1,1-TCA) in January of 1993.

- 4.5 The waste stream of chemicals discussed in Finding 4.4 above is unclear. Recycling of chemicals has occurred at the site but there is no correlation between amount of chemicals purchased and the amount of chemicals recycled. For example, in 1980, 830 gallons of the four chemicals used above were purchased, yet, none was recycled, and in 1981, 800 gallons were purchased but 275 gallons were recycled. Likewise, in 1982, 615 gallons were purchased and 220 were recycled and in 1983, 1,560 gallons were purchased and none was recycled. Annual purchases of PCE between 1980 and 1983 ranges from 220 to 330 gallons.
- 4.6 A large commercial-type vapor degreaser has been used on the north side of the facility between 1985 and the present. Prior to 1985 a "round 55 gallon type degreaser" was used. The location of this earlier degreaser is not known by Board staff. Site inspection by Board staff in 1992 indicated a large commercial size PCE vapor degreaser. The degreaser at that time was in the initial stages of having secondary containment structure installed. Currently the secondary containment is place.
- 4.7 During inspections of the site, Board staff has noted bad lighting, debris piles on the south side of the building, and no secondary containment for 55 gallon drums of PCE. Review of the Los Angeles Regional Water Quality Control Board's files regarding chemical use at E/M's North Hollywood facility also noted similar types of conditions .

5. PREVIOUS SOIL INVESTIGATIONS

- 5.1 Soil gas surveys have been done on two separate occasions on the south side of the E/M property. The first survey, done between March 19th and 27th, 1987, was a regional survey conducted by HP. The second was done on March 13, 1987, by E/M on the south side of their building.
- 5.2 The first soil gas survey covered areas around HP, E/M and many other properties along Maude and Clyde Avenues. The survey tested soil gas only for PCE, Freon 113, 1,1,1-TCA and TCE. Areas that have soil contamination in this particular survey seem to be indicated by soil gas concentrations greater than 100 ug/l air of a particular constituent. Chemicals with concentrations of 100 ug/l or greater in soil gas are PCE and TCE on the south side of the HP

building 31 and PCE on the south side of the E/M building along Hewlett-Packard's northern fence.

- 5.3 The second soil gas survey was done on March 13, 1987 in the area immediately south of the E/M building in the area reportedly used for chemical storage. This area includes the 10 foot wide paved strip of land and the planter strip. The results of the survey indicate a variety of chemicals present including DCA, MEK, Ethanol, TCE, and PCE. The PCE concentrations in the soil gas were the highest of all constituents detected (3,700 ug/l air) and are indicative of soil contamination as described in Finding 5.2 above. The concentrations of PCE are highest near each of the two doors on the south side of the E/M building. These high concentrations coincide with the unhealthy looking oleander bushes described in Finding 5.12 below.
- 5.4 Soil borings at the E/M facility have been concentrated on the south side of the facility. Discussions of soil contamination below are limited to investigations done in areas which are or were reasonably influenced by the daily operations at the E/M facility. Other soil data gathered in areas reasonably influenced by the daily operations at HP will be discussed under Adjacent Investigations and Remediation below.
- 5.5 Soil samples on the south side area of E/M were collected from five surface samples and seven borings during various phases of investigation. Five surface soil samples were collected as described in finding 2.2 above. Four borings were drilled in April, 1987 to a max depth of 11.5 feet and three more borings were hand augured, in March 1988, to a depth of at least 20 feet.
- 5.6 Three separate groundwater monitoring wells were installed in March 1988. The wells varied from 39 to 48 feet deep and included soil samples.
- 5.7 PCE contamination is the primary constituent of concern at the E/M property. It is found in 30 out of 31 samples taken, as described in 5.5 above, by E/M during investigations at the site. On the north side of the building, in wells EM-1 and EM-2, PCE soil samples range from 60 to 310 ppb. On the south side of the building PCE concentrations in soil samples were found up to 8,200 ppb. Vertical distribution on the south side indicates most of the highest levels of PCE are located near the surface with lower levels found throughout the rest of the vadose zone. This distribution is most likely influenced by soil type.
- 5.8 TCE in soil is found in several samples at concentrations up to 160 ppb in soil samples from borings and groundwater well installation.

- 5.9 MEK distribution in soil is found at a concentration of 275 and 250 ppb in different sampling events near the chemical storage shed on the south side of the E/M facility in 1985 and 1986. No other soil sampling for MEK has been done on the north side of the fence. Soil gas sampling done by E/M confirms that MEK is present.
- 5.10 Toluene is found in three soil samples taken in the planter area in 1985. These samples have not been confirmed by soil gas sampling done on the south side which tested for toluene.
- 5.11 Other chlorinated solvents found in soil, such as 1,1-DCA and 1,1,1-TCA are found at concentrations of to 60 and 100 ppb respectively.
- 5.12 Stressed vegetation on the south side of the E/M building has an unusual pattern. The oleander bushes, which are planted along most of the southern boundary of the HP site, are unusually thin directly outside of each of the two doors of the E/M building that face south. Aerial photos indicate this pattern is consistent through time.
- 5.13 Metals contamination at the site has been investigated by the County of Santa Clara Health Department. The results of testing for Title 22 metals indicate 51,000 ppm molybdenum and 47,000 ppm lead in discolored soil in the south side planter area.

6. PREVIOUS GROUNDWATER INVESTIGATIONS

- 6.1 Groundwater monitoring wells EM-1, EM-2, and EM-3 were installed in 1988 in the shallow aquifer to monitor ground water in the vicinity of the building. VOCs, including PCE, are consistently detected in all three wells.
- 6.2 PCE concentrations in the groundwater have been the highest (1,100 ppb in EM-3) of any chemical found on-site. Groundwater in wells EM-2 and -3 are between 140 and 1,100 ppb PCE while EM-1 ranges from 27 to 140 ppb. Well EM-2 has revealed the highest concentrations of 1,1-DCE (between 110 and 460 ppb).
- 6.3 TCE distribution in the groundwater indicates the highest levels in EM-3 (averaging approximately 100 ppb), moderate levels in EM-2 (avg. 35 ppb), and the lowest levels in EM-1 (avg. 20 ppb). The maximum concentration of TCE was in EM-3 at 190 ppb.

- 6.4 Other chemicals such as 1,1,1-TCA, 1,1-DCE and 1,1-DCA have been found in the groundwater. The pattern of 1,1,1-TCA in the three wells is similar to PCE with EM-3 the highest (13 to 100 ppb) and EM-1 the lowest (ND to 20). 1,1-DCE is slightly higher in EM-2 (110 to 460 ppb) than EM-1 (99 to 290 ppb) and EM-3 (55 to 240 ppb). 1,1-DCA has similar levels in all three wells, typically ranging from 200 to 500 ppb. EM-2 has one high level of 1,1-DCA at 980 ppb.
- 6.5 MEK and Toluene are not found in the groundwater. MEK has not been tested for in groundwater at the E/M facility.

7. ADJACENT INVESTIGATIONS AND REMEDIATION

- 7.1 The HP facility to the south of E/M has been investigating contaminants in the subsurface since 1983. These investigations have confirmed that VOCs have affected soil and ground water beneath the site and polluted ground water has migrated off-site.
- 7.2 Chemicals used at the HP facility include TCE, PCE, acetone, and freon(s). Manufacturing activities were conducted between 1965 and 1981. These chemicals were stored and used primarily in the south side loading dock area as indicated by aerial photos. The two chemicals of concern are TCE and PCE.
- 7.3 Chemicals found in soil gas at the HP facility include TCE, PCE, Freon 113, and 1,1,1-TCA. Two major areas at the HP facility were found to contain /chemicals, the southern loading dock area and the property boundary area near E/M. The southern loading dock contains significant (greater than 100 ug/l air) detections of PCE and TCE and the property boundary, near E/M, contains significant amounts PCE.
- 7.4 Chemicals in groundwater are found in a band stretching from the HP south side storage area toward the E/M facility and continuing to the north. The highest concentrations of PCE in groundwater are found beneath the boundary with E/M and the highest concentrations of TCE in groundwater are found beneath the southern loading dock of the HP facility.
- 7.5 HP has been capturing and treating ground water containing VOCs since June 1988 from the southern loading dock area of HP and in the northern portion of their site, near the property boundary with E/M.

8. The chemical signature in the soil and groundwater on the south side of the E/M building, as set forth in the previous findings, indicates that it is a waste discharger.
9. E/M Lubricants is a primary discharger because it has released PCE and other volatile organic compounds to the soil and groundwater as indicated in the previous findings. R.W. Vogel is a secondary discharger because he is the current property owner.
10. The Board adopted an amended Water Quality Control Plan for the San Francisco Bay Region (Basin Plan) in December 1991.
11. The Basin Plan defines beneficial uses for all major water bodies in the Region, including the South San Francisco Bay and contiguous surface and ground waters.
12. The existing and potential beneficial uses of the ground water underlying and adjacent to the facility include:
 - a. Industrial process water supply
 - b. Industrial service water supply
 - c. Municipal and Domestic water supply
 - d. Agricultural water supply
13. The discharger has caused or permitted, and threatens to continue to cause or permit waste to be discharged or deposited where it is or probably will be discharged to waters of the State and create or threaten to create a condition of pollution or nuisance.
14. This action is an order to enforce the laws and regulations administered by the Board. This action is categorically exempt from the provisions of the CEQA pursuant to Section 15321 of the Resources Agency Guidelines.
15. Cleanup and Abatement Order No. 93-49 is hereby rescinded.

IT IS HEREBY ORDERED, pursuant to Section 13304 of the California Water Code, that E/M Corporation and R.W. Vogel, dba Delucci and Vogel, shall cleanup and abate the effects described in the above findings as follows:

A. PROHIBITIONS:

1. The discharge of wastes or hazardous materials in a manner which will

degrade water quality or adversely affect beneficial uses of the waters of the State is prohibited.

2. Further significant migration of pollutants through subsurface transport to waters of the State is prohibited.
3. Activities associated with the subsurface investigation and cleanup which will cause significant adverse migration of pollutants are prohibited.

B. SPECIFICATIONS:

1. The storage, handling, treatment or disposal of polluted soil or groundwater shall not create a nuisance as defined in Section 13050(m) of the California Water Code.
2. The discharger shall conduct site investigations and monitoring activities to the satisfaction of the Executive Officer to define the local hydrogeological conditions, and the lateral and vertical extent of the soil and groundwater pollution. Should monitoring results show evidence of pollution migration, additional plume characterization of pollutant extent may be required.

C. PROVISIONS:

1. Investigation Requirement The discharger shall perform all investigations and remedial work in accordance with requirements of this Order.
2. Self Monitoring Reporting The discharger shall submit to the Board acceptable monitoring reports containing results of work performed according to the attached self-monitoring program.
3. Tasks to be Completed E/M Corporation shall comply with the tasks listed below according to the following schedule immediately upon adoption. Within sixty (60) days of the Executive Officer's determination and actual notice to R.W. Vogel dba Delucchi and Vogel that the "primarily responsible" discharger under this Order has failed to comply with this Order, R.W. Vogel dba Delucchi and Vogel, as landowner of the property at 875B Maude Avenue, shall itself then be responsible for complying with this Order. The discharger shall complete the following:

a. **TASK: SUBMIT CHEMICAL USE HISTORY AND IDENTIFY PREVIOUS SITE USERS**

COMPLETION DATE: June 30, 1993

Submit a technical report acceptable to the Executive Officer containing a summary of the types, quantities and methods of handling chemicals at the site during E/M Corporations occupancy. Identify chemical purchase, disposal, and recycling using purchase orders, in addition to recycling and disposal manifests. Also, submit all available information on previous occupants in addition to a construction and occupancy chronology.

b. **TASK: SUBMIT A QUALITY ASSURANCE PROJECT PLAN**

COMPLETION DATE: July 30, 1993

Submit a technical report acceptable to the Executive Officer documenting quality assurance procedures to be used during activities relating to this Order. This plan must outline procedures for soil sampling, monitoring well installation, groundwater sampling, soil gas sampling and other activities conducted during investigation. The plan shall include, but not be limited to, discussions of how the following topics will be performed and/or presented:

- 1) new subsurface data (boring, CPT, well, etc) logs;
- 2) copies of new well installation permits;
- 3) tabulated results of soil and groundwater pollutant analyses;
- 4) appropriately scaled maps;
- 5) surface and subsurface data point locations;
- 6) site-specific geologic, and chemical cross sections;
- 7) explanation of vertical and lateral extent of the soil and groundwater pollution;
- 8) an evaluation of potential conduits for the vertical migration of pollutants;
- 9) description of site hydrogeologic conditions;
- 10) evaluation of the extent to which soil pollution may be contributing to groundwater pollution; and,
- 11) submittal of further work to be done to complete a Task, including off-site investigation or remediation.

c.1 **TASK: PROPOSE VADOSE ZONE CHARACTERIZATION**

COMPLETION DATE: October 18, 1993

Submit a technical report acceptable to the Executive Officer

containing a workplan to characterize the vertical and lateral extent of contamination in the vadose zone. The workplan shall identify specific tasks and a time schedule for task completion.

c.2 TASK: COMPLETE VADOSE ZONE CHARACTERIZATION AND PROPOSE INTERIM REMEDIAL MEASURES

COMPLETION DATE: according to time schedule submitted in Task 3.c.1.

Submit a technical report acceptable to the Executive Officer documenting completion of the necessary tasks identified in the approved technical report submitted for Task 3.c.1. and a workplan to remediate the vadose zone contamination that has

been delineated. The workplan shall identify specific tasks and a time schedule for task completion

c.3 TASK: IMPLEMENT VADOSE ZONE INTERIM REMEDIATION MEASURES

COMPLETION DATE: according to time schedule approved in Task 3.c.2.

Submit a technical report acceptable to the Executive Officer documenting completion of the necessary tasks identified in the approved technical report submitted for Task 3.c.2.

d.1 TASK: PROPOSE GROUNDWATER CHARACTERIZATION

COMPLETION DATE: October 18, 1993

Submit a technical report acceptable to the Executive Officer containing a workplan to characterize the vertical and lateral extent of on- and off-site contamination in the groundwater. The workplan shall identify specific tasks and a time schedule for task completion.

d.2 TASK: COMPLETE GROUNDWATER CHARACTERIZATION AND PROPOSE INTERIM REMEDIATION MEASURES

COMPLETION DATE: according to time schedule approved in Task 3.d.1

Submit a technical report (Remedial Investigation) acceptable to the Executive Officer documenting completion of the necessary tasks identified in the approved technical report submitted for Task 3.d.1 and a workplan to remediate on- and off-site groundwater contamination that has been delineated. The workplan shall identify specific tasks and a time schedule for the task completion.

d.3 TASK: IMPLEMENT GROUNDWATER INTERIM REMEDIATION MEASURES

COMPLETION DATE: according to time schedule approved in Task 3.c.2.

Submit a technical report acceptable to the Executive Officer documenting completion of the necessary tasks identified in the approved technical report submitted for Task 3.d.2.

**e. TASK: PROPOSED FINAL CLEANUP OBJECTIVES AND ACTIONS
COMPLETION DATE: ONE YEAR AFTER THE
START-UP OF INTERIM REMEDIAL MEASURES DESCRIBED IN
TASK 3.d.3.**

Submit a technical report acceptable to the Executive Officer, containing the results of a feasibility study evaluating alternative final remedial measures and the recommended measures necessary to achieve final cleanup objectives. The technical report must also include the tasks and time schedule necessary to implement the recommended final remedial measures. The remedial investigation and feasibility study shall be consistent with the guidance provided by Subpart F of the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR Part 300); Section 25356.1 (c) of the California Health and Safety Code; CERCLA guidance documents with reference to Remedial Investigation, Feasibility Studies, and Removal Actions; and the State Water Resources Control Board's Resolution No. 68- 16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California".

4. Cost Recovery Pursuant to Section 13304 of the Water Code, the discharger is hereby notified that the Regional Board is entitled to, and may seek reimbursement for, all reasonable costs actually incurred by the Regional Board to investigate unauthorized discharges of waste and to oversee cleanup of such waste, abatement of the effects thereof, or other remedial action, required of this Order. Upon receipt of a billing statement for such costs, the discharger shall reimburse the Regional Board.

5. Missed Completion Dates If the discharger is delayed, interrupted or prevented from meeting one or more of the completion dates specified in this Order, the dischargers shall promptly notify the Executive Officer. In the event of such delays the Board may consider modifications of the task completion dates established in this Order.

6. Monthly Reporting Technical reports on compliance with the Prohibitions, Specifications, and Provisions of this Order shall be submitted monthly to the Board commencing with the report due July 15, 1993 monitoring the previous months activities. This monthly reports shall be provided until December, 1994 and shall consist of a letter report that, (1) summarizes work completed since submittal of the previous report, and work projected to be completed by the time of the next report, (2) identifies any obstacles which may threaten compliance with the schedule of this Order and what actions are being taken to overcome these obstacles, and (3) includes, in the event of non-compliance with Provision C.3 or any other Specification or Provision of this Order, written notification which clarifies the reasons for non-compliance and which proposes specific measures and a schedule to achieve compliance. This written notification shall identify work not completed that was projected for completion, and shall identify the impact of non-compliance on achieving compliance with the remaining requirements of this Order.
7. General Performance Goals for Technical Reports The reports required in Item 3 of this Order shall be conducted to meet the following performance goals listed below:
 - a. The discharger's groundwater plume should be defined laterally and vertically by water quality measurements for all chemicals released from the discharger's site, and their transformation products at least to the level of appropriate water quality criteria.
 - b. The source of chemicals should be identified for each point of discovery.
 - c. All sampling should be done in a manner that ensures the highest degree of accuracy and precision pursuant to the approved Quality Assurance Project Plan.
8. Hydrogeologic Aspects of Technical Reports The reports required in Item 3 of this Order must take into account the following:
 - a. Lithologic units should be monitored individually so that chemical concentrations, both original chemicals and their daughter products, within each individual unit are determined. The entire hydrostratigraphic unit should be adequately monitored to ensure

both a representative and nondilute sample. This should occur at the plume boundaries and at other locations to provide support for investigative conclusions, and to confirm the adequacy and efficiency of remediation.

- b. A sufficient number of monitoring wells should be installed to ensure that all classes of chemicals, e.g. "sinkers" versus "floaters", are detected and monitored.
- c. Hydraulic interconnections, either vertical or lateral, and the effect of any interconnections on chemical movement should be documented and defined.
- d. Hydraulic information for the investigative area should be of sufficient quantity and quality to maximize extraction efficiency during remediation.

9. Geologic Aspects of Technical Reports The reports required in Item 3 of this Order must take into account the following:

- a. Sampling during well, boring or piezometer installation should ensure the following:
 - i) that information is obtained for 100% of the borehole.
 - ii) that detailed lithologic and physical descriptions with estimates of the amount of lithologic constituents are obtained, in addition to any other classification systems.
 - iii) that the individual chemical concentrations of each lithologic strata within the borehole are determined by a reliable and systematic manner of sampling when sampling is done to meet the above goals.
- b. Hydrostratigraphic zones should be defined by documenting the existence of a significant, continuous and widespread aquitard underlying both the specific well location and the entire investigative areas. Should the hydrostratigraphic zone remain undefined because such documentation is not provided, continued vertical migration will be considered possible throughout the area and monitoring beneath the contaminated zone will be required.

- c. Any Critical lithologic designations should be confirmed by laboratory analysis.
 - d. Stratigraphic correlations should be done utilizing lithologic logs in conjunction with additional data on the physical characteristics of the strata obtained from methodologies other than those used to produce the lithologic logs.
10. Report Certification All hydrogeological plans, specifications, reports, and documents shall be signed by or stamped with the seal of a registered geologist, engineering geologist or professional engineer. This requirement shall not apply to monthly reports and quarterly monitoring reports provided the hydrogeological information contained in these reports has been submitted or is scheduled for submittal by a registered geologist, engineering geologist, or professional engineer.
11. Lab Certification All samples shall be analyzed by State certified laboratories or laboratories accepted by the Board using approved EPA methods for the type of analysis to be performed. All laboratories shall maintain quality assurance/quality control records for Board review.
12. Cleanup System Maintenance The discharger shall maintain in good working order, and operate as efficiently as possible, any facility or control system installed by the discharger to achieve compliance with the requirements of this Order.
13. Mail Distribution List Copies of all correspondence, reports, and documents pertaining to compliance with the Prohibitions, Specifications, and Provisions of this Order, shall be provided to the following agencies:
- a. Santa Clara Valley Water District (Tom Iwamura)
 - b. Santa Clara County Health Department (Lee Esquibel)

The discharger shall provide copies of cover letters, title page, table of contents and the executive summaries of compliance reports except for the proposal for groundwater remediation and the proposal for vadose zone remediation which will be submitted in full to the following agencies:

- a. Santa Clara County Health Department (Bill Grimes)
- b. City of Mountain View
- c. California EPA/DTSC Site Mitigation Branch (Barbara Cook)

14. Board Staff Access The discharger shall permit the Board or its authorized representative, in accordance with Section 13267(c) of the California Water Code:
 - a. Entry upon premises in which any pollution sources exist, or may potentially exist, or in which any required records are kept, which are relevant to this Order.
 - b. Access to copy any records required to be kept under the terms and conditions of this Order.
 - c. Inspection of any monitoring equipment or methodology implemented in response to this Order.
 - d. Sampling of any groundwater or soil which is accessible, or may become accessible, as part of any investigation or remedial action program undertaken by the discharger.
15. Change in Ownership or Occupancy The discharger shall file a report on any changes in site occupancy and ownership associated with the facility described in this Order within 60 days of said changes.
16. Unregulated Discharge If any hazardous substance is discharged in or on any waters of the state, or discharged and deposited where it is, or probably will be discharged in or on any waters of the state, the dischargers shall report such discharge to this Regional Board, at (510) 286-1255 on weekdays during office hours from 8 a.m. to 5 p.m., and to the Office of Emergency Services at (800) 852-7550 during non-office hours. A written report shall be filed with the Regional Board within five (5) working days and shall contain information relative to: the nature of waste or pollutant, quantity involved, duration of incident, cause of spill, Spill Prevention, Control, and Countermeasure (SPCC) Plan in effect, if any, estimated size of affected area, nature of effects, corrective measures that have been taken or planned, and a schedule of these activities, and persons/agencies notified.
17. Order Revisions The Board or the Executive Officer will review this Order periodically and may revise the requirements when necessary.

Pursuant to California Water Code Sections 13304, 13350, 13385, 13386, and 13387, if the discharger fails to comply with the provisions of this Order and any subsequent amendments, the Executive Officer may request the Attorney General to take appropriate enforcement against the discharger including injunctive relief; or the

Regional Board may schedule a hearing to consider requesting the Attorney General to take appropriate enforcement action against the discharger, including injunctive and civil monetary remedies; or the Board may schedule a hearing to administratively impose civil liability not to exceed five thousand dollars (\$5000) for each day the Order is violated.

9/9/93

Date



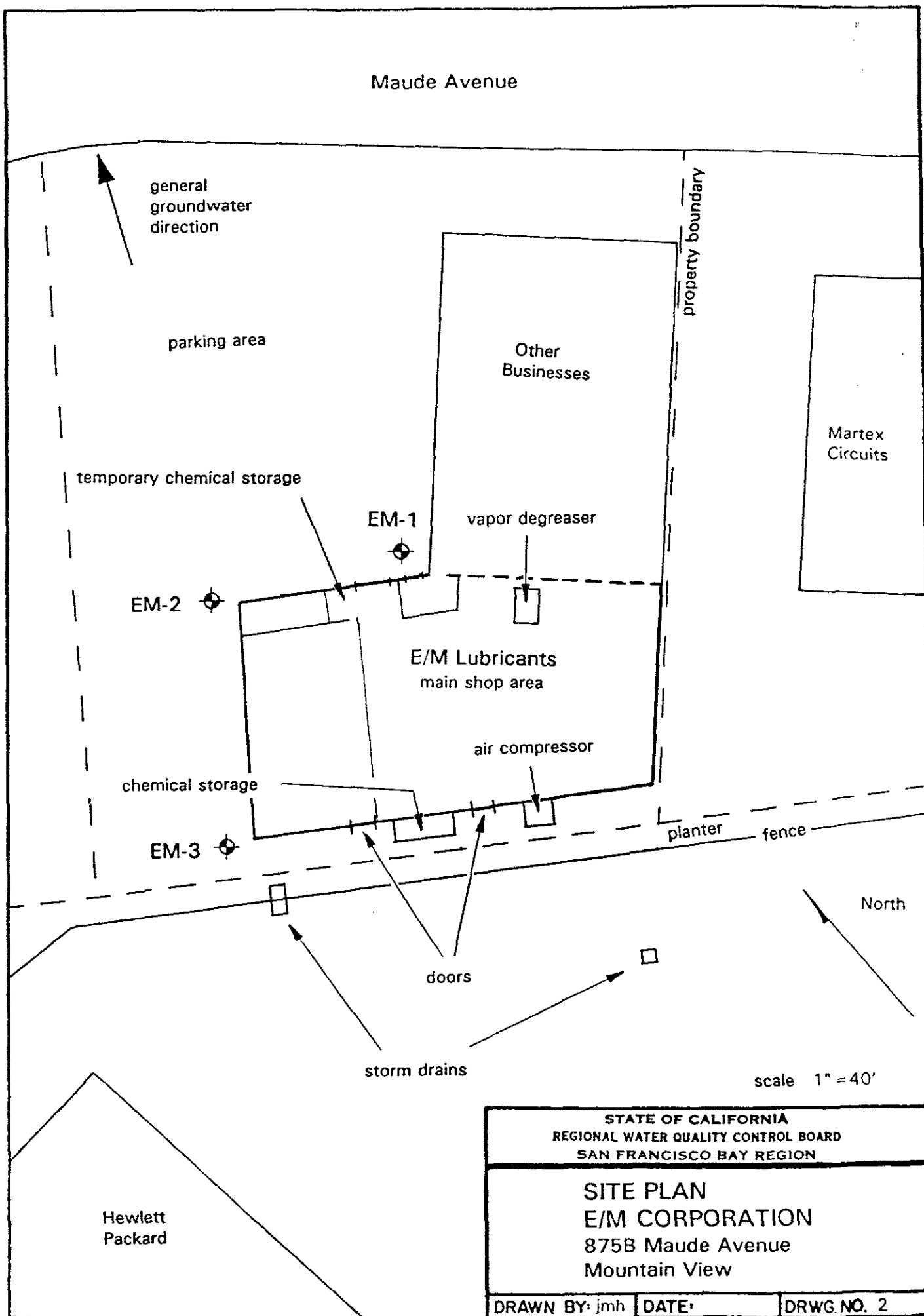
Steven R. Ritchie
Executive Officer

Attachments: Figure 1 Site location map
 Figure 2 site plan
 Self Monitoring Program



STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

SITE LOCATION MAP
E/M CORPORATION



CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

E/M CORPORATION
875B MAUDE AVENUE FACILITY
GROUNDWATER SELF-MONITORING PROGRAM

A. GENERAL

Reporting responsibilities of waste dischargers are specified in Sections 13225(a), 13267(b), 13268, 13383, and 13387(b) of the California Water Code and this Regional Board's Resolution No. 73-16.

The principal purposes of a waste discharger's monitoring program, also referred to as a self-monitoring program (SMP), are: (1) To document compliance with waste discharge requirements and prohibitions established by this Regional Board, (2) To facilitate self-policing by the waste discharger in the prevention and abatement of pollution arising from waste discharge, (3) To develop or assist in the development of effluent or other limitations, discharge prohibitions, national standards of performance, pretreatment and toxicity standards, and other standards, and (4) To prepare water and wastewater quality inventories.

B. SAMPLING AND ANALYTICAL METHODS

Sample collection, storage, and analyses shall be performed according to the EPA Method 8000 series described in "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods", dated November 1986; or other methods approved and specified by the Executive Officer of this Regional Board.

Whenever possible, all reporting and method detection limits for all analyses shall be less than the state action level, or the Maximum Contaminant Level, whichever is smaller.

Turbidity measurements in NTU units shall be taken before a groundwater sample is collected from each well. Results of the analyses shall be reported to the Board with the quarterly sampling results.

C. REPORTS TO BE FILED WITH THE REGIONAL BOARD

1. Violations of Requirements

In the event the discharger is unable to comply with the conditions of the site cleanup requirements and prohibitions due to:

- a. maintenance work, power failures, or breakdown of waste treatment equipment, or
- b. accidents caused by human error or negligence, or
- c. other causes, such as acts of nature, or
- d. poor operation or inadequate system design, or
- e. a construction project,

the discharger shall notify the Regional Board office by telephone as soon as he or his agents have knowledge of the incident and confirm the notification in writing within 5 working days of the telephone notification. The written report shall include time, date, and person notified of the incident. Within 15 working days of the incident, the discharger shall submit a report describing the nature of the incident, and costs and scheduling of all action necessary to preclude such future discharges.

2. Self Monitoring Reports

a. Reporting Period:

Written reports shall be filed quarterly, due thirty days after the end of each calendar quarter until further notice is given by the Executive Officer.

b. Letter of Transmittal:

A letter transmitting self-monitoring reports shall accompany each report. Such a letter shall include a discussion of requirement violations found during the reporting period and actions taken or planned for correcting any requirement violation. If the discharger has previously submitted a detailed time schedule for correcting requirement violations, a reference to this correspondence will be satisfactory. Monitoring reports and the letter transmitting reports shall be signed by either a principal executive officer or, his duly authorized representative of that person. The letter shall contain a statement by the official, under penalty of perjury, that to the best of the signer's knowledge the report is true and correct.

c. Results of Analysis and Observations:

- (1) Results from each required analysis and observation shall be submitted in the quarterly self-monitoring regular reports. Results may also be submitted in the monthly report or be discussed on a weekly basis with Board staff. *All chromatographic peaks for purgable halocarbons and/or volatile organics shall be identified and quantified if a peak is identified in two consecutive samples.* Quarterly water level data shall also be submitted in the report.
- (2) The quarterly reports, if noncompliance occurs, shall include a discussion of unexpected operational changes *which could affect performance of the extraction system,* such as flow fluctuations, maintenance shutdown, etc.
- (3) The SMR shall include the groundwater extraction rates from each extraction well, water level data from the extraction wells, and the results of any aquifer tests conducted.
- (4) The quarterly report shall also identify the analytical procedures used for analyses either directly in the report or by reference to a standard plan accepted by the Executive Officer. Any special methods shall be identified and should have prior approval of the Board's Executive Officer.
- (5) The discharger shall describe, in the quarterly SMR, the reasons for significant increases in a pollutant concentration at a well onsite. The description shall include:
 - a) the source of the increase,
 - b) how E/M determined or will investigate the source of the increase, and
 - c) what source removal measures have been completed or will be proposed.
- (6) Original lab results shall be retained and shall be made available for inspection for six years after origination or until after all continuing or impending legal or administrative actions are resolved.

- (7) The SMR shall include a summary of work completed since submittal of the previous report, design specifications if applicable, and work projected to be completed by the time of the next report.
- (8) The SMR shall include tabulated results of self monitoring water quality sampling analyses for all wells using analytical methods specified in Provision B (SAMPLING AND ANALYTICAL METHODS). Each report shall include updated isoconcentration maps of VOCs in groundwater.
- (9) The SMR shall include updated water table and piezometric surface maps, based on the most recent water level measurements for all affected water bearing zones for all on-site and off-site areas. Piezometric surface maps must use all information in the area. The information (both chemical and piezometric) must be placed on appropriately scaled and detailed base maps showing the location of all monitoring and extraction wells and identifying adjacent facilities and structures. Interpretations of the data shall be discussed.
- (10) A map or maps shall accompany the quarterly report, showing all sampling locations and plume contours for the predominant chemical(s), or other indicator chemicals upon request by the Executive Officer.
- (11) The annual report shall be combined with the fourth quarter regular report and shall include cumulative data for the current year. The annual report for December shall also include minimum, maximum, median and average water quality data for the year and a summary of water level data. The report shall contain both tabular and graphical summaries of historical monitoring data.

3. Self-Monitoring Program Revisions:

Additional long term or temporary changes in the sample collection frequency and routine chemical analysis may become warranted as monitoring needs change. These changes shall be based on the following criteria and shall be proposed in a quarterly SMR. The changes shall be implemented no earlier than 45 days after self-monitoring report is submitted for review or not at all if the proposal is found to be unacceptable.

Criteria for SMP revision:

- (1) Discontinued analysis for a routine chemical parameter for a specific well after a two-year period of below detection limit values for that parameter.
- (2) Changes in sampling frequency for a specific well after a two-year period of below detection limit values for all chemical parameters from that well.
- (3) Temporary increases in sampling frequency or changes in requested chemical parameters for a well or group of wells because of a change in data needs (e.g., evaluating groundwater extraction effectiveness or other remediation strategies).
- (4) Add routine analysis for a chemical parameter if the parameter appears as an additional chromatograph peak in three consecutive samples from a particular well.
- (5) Alter sampling frequency based on evaluation of a collective data base.

D. DESCRIPTION OF SAMPLING STATIONS

All existing and future monitoring and extraction wells shall be monitored as appropriate. See Table 1 and Figure 2 for monitoring wells installed at the time of the adoption of this SMP.

E. SCHEDULE OF SAMPLING AND ANALYSIS

1. All wells at the E/M site shall be sampled according to the schedule in Table 1 using EPA methods 8010 and 8020. EPA method 8240 shall be used in lieu of EPA methods 8010 and 8020 for all the wells during the fourth quarter of each year, with specific monitoring frequency given in an updated Table 1. All wells shall also be sampled for CAM metals and molybdenum for two quarters then annually thereafter. Sampling and monitoring shall be coordinated with other parties performing treatment and investigations in the area including Hewlett-Packard. E/M is ultimately responsible for monitoring its wells, although results may be obtained from other parties performing investigations in the area.

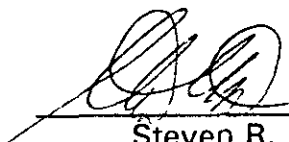
2. In addition, if a previously undetected compound or peak is detected in a sample from a well, a second sample shall be taken within a week after the results from the first sample are available. All chromatographic peaks detected in two consecutive samples shall be identified and quantified in the self-monitoring report.
3. Groundwater elevations shall be obtained on a quarterly basis from all wells at the site and submitted in the self-monitoring report with the sampling results.
4. Well depths shall be determined on an annual basis and compared to the depth of the well as constructed. If greater than 90 percent of the screen is covered the discharger shall clear the screen by the next sampling.

The schedule of sampling and analysis is given in Table 1.

I, Steve R. Ritchie, Executive Officer, hereby certify that the foregoing Self-Monitoring Program:

1. Has been developed in accordance with the procedure set forth in this Regional Board's Resolution No. 73-16 in order to obtain data established in Regional Board Order No. 93-49.
2. Is effective on the date shown below.
3. May be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the dischargers and revisions will be ordered by the Executive Officer.

9/9/93
Date



Steven R. Ritchie
Executive Officer

Attachment: Table 1



Table 1

MONITORING SCHEDULE FOR 875B MAUDE AVENUE FACILITY

	Quarterly	Semi-annually	Annually
EM-1	X		
EM-2	X		
EM-3	X		

